

WEST Search History

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DATE: Monday, August 30, 2004

| Hide? | Set Name | Query | Hit Count |
|--------------------------|-------------|--|--------------|
| | | <i>DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=ADJ</i> | |
| <input type="checkbox"/> | L8 | BB near 2F near 3F near B | 3 |
| <input type="checkbox"/> | L7 | t-nFFm | 2 |
| <input type="checkbox"/> | L6 | L5 same liquid crystal\$ | 5 |
| <input type="checkbox"/> | L5 | t?FF? | 1957 |
| | | <i>DB=PGPB; PLUR=NO; OP=ADJ</i> | |
| <input type="checkbox"/> | L4 | US-20030222245-A1.did. | 1 |
| <input type="checkbox"/> | L3 | US-20030222245-A1.did. | 1 |
| <input type="checkbox"/> | L2 | US-20030222245-A1.did. | 1 |
| | | <i>DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=ADJ</i> | |
| <input type="checkbox"/> | L1 | us-6348244-\$.did. or jp-2001114722-\$.did. or de-10152831-\$.did. or us-20030222245-\$.did. | 7 |

END OF SEARCH HISTORY

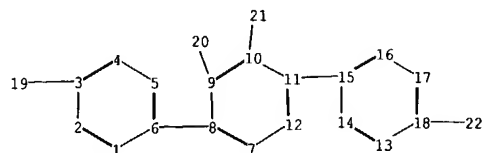
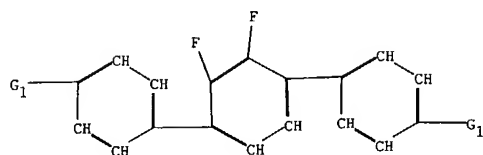
WEST Search History

DATE: Monday, August 30, 2004

| Hide? | <u>Set</u> <u>Name</u> | <u>Query</u> | <u>Hit</u> <u>Count</u> |
|--------------------------|---------------------------|---|----------------------------|
| | | <i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=ADJ</i> | |
| <input type="checkbox"/> | L8 | BB near2 F near F near B | 29 |
| <input type="checkbox"/> | L7 | PYP-1-2 or PYP-2-2 or PYP-2-3 or PYP-2-4 or PYP-3-1 or PYP-3-3 or PYP-3-5 or PYP-3-O2 or PYP-3-O4 | 2 |
| <input type="checkbox"/> | L6 | PYP-1-2 or PYP-2-2 or PYP-2-3 or PYP-2-4 or PYP-3-1 or PYP-3-3 or PYP-3-5 or PYP-3-O2 or PYP-3-O4. | 2 |
| | | <i>DB=USPT,EPAB,JPAB,DWPI,TDBD; PLUR=NO; OP=ADJ</i> | |
| <input type="checkbox"/> | L5 | l4 and 2,3-difluoro\$ | 17 |
| <input type="checkbox"/> | L4 | pyp-2\$ or pyp-3\$ | 20 |
| <input type="checkbox"/> | L3 | L2 and positive dielectric | 29 |
| <input type="checkbox"/> | L2 | L1 and liquid crystal\$ | 32 |
| <input type="checkbox"/> | L1 | pyp-\$ | 35 |

END OF SEARCH HISTORY

(Untitled)



chain nodes :

19 20 21 22

ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

chain bonds :

3-19 6-8 9-20 10-21 11-15 18-22

ring bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 13-14 13-18 14-15
15-16 16-17 17-18

exact/norm bonds :

3-19 18-22

exact bonds :

6-8 9-20 10-21 11-15

normalized bonds :

1-2 1-6 2-3 3-4 4-5 5-6 7-8 7-12 8-9 9-10 10-11 11-12 13-14 13-18 14-15
15-16 16-17 17-18

G1:C,O

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:CLASS 20:CLASS
21:CLASS 22:CLASS

L9 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN
 AN 2003:815300 CAPLUS
 DN 139:314605
 ED Entered STN: 17 Oct 2003
 TI Liquid crystalline medium and electrooptical display containing it
 IN Klasen-Memmer, Melanie; Bremer, Matthias; Rillich, Malgorzata
 PA Merck Patent G.m.b.H., Germany
 SO Eur. Pat. Appl., 66 pp.
 CODEN: EPXXDW
 DT Patent
 LA German
 IC ICM C09K019-42
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 Section cross-reference(s): 75

FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|------------------|----------|
| PI | EP 1352943 | A1 | 20031015 | EP 2003-5738 | 20030314 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| | DE 10216197 | A1 | 20031030 | DE 2002-10216197 | 20020412 |
| | JP 2003327965 | A2 | 20031119 | JP 2003-108054 | 20030411 |
| | US 2003222245 | A1 | 20031204 | US 2003-412590 | 20030414 |
| PRAI | DE 2002-10216197 | A | 20020412 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|---------------|-------|------------------------------------|
| EP 1352943 | ICM | C09K019-42 |
| EP 1352943 | ECLA | C09K019/42 |
| DE 10216197 | ECLA | C09K019/42 |
| US 2003222245 | ECLA | C09K019/42 |

OS MARPAT 139:314605

AB A nematic liquid crystal medium comprises (a) a neg. dielec. liquid crystal component containing a compound represented by R11-p-C6H4-[-Z11-A11-]n-Z12-A12-R12 (R11, R12 = C1-7-alkyl, alkoxy, C2-7-alkoxyalkyl, alkenyl, alkenyloxy; A11, A12 = 1,4-phenylidene containing 0-2 F-substituents; Z11, Z12 = -CH2CH2-, -CH2CF2-, -CF2CH2-, -OCH2-, -CH2O-, -OCF2-, -CF2O, single bond; n = 0, 1), (b) a neg. dielec. liquid crystal component, (c) optionally a neutral dielec. liquid crystal component, and (d) optionally a pos. dielec. liquid crystal component. The nematic liquid crystal medium is especially suitable for ECB (elec. controlled birefringence) or IPS (in plane switching) liquid crystal displays.

ST nematic liq crystal medium electrooptical display neg dielec component

IT Liquid crystal displays
 (nematic liquid crystal mixture suitable for ECB- or IPS-type liquid crystal displays)

IT Liquid crystals
 (nematic; nematic liquid crystal mixture suitable for ECB- or IPS-type liquid crystal displays)

| | | | | | | |
|----|-------------|-------------|-------------|-------------|-------------|------------|
| IT | 4856-04-6 | 79709-84-5 | 80944-44-1 | 81936-32-5 | 82991-48-8 | 84540-37-4 |
| | 85600-56-2 | 92263-41-7 | 96624-52-1 | 97398-80-6 | 98321-58-5 | |
| | 102714-93-2 | 106349-49-9 | 116020-44-1 | 117713-14-1 | 121218-80-2 | |
| | 122412-08-2 | 129738-34-7 | 129738-42-7 | 134462-11-6 | 154346-21-1 | |
| | 155041-85-3 | 157248-24-3 | 157248-25-4 | 157248-27-6 | | |
| | 174806-92-9 | 174806-93-0 | 174806-94-1 | 174806-96-3 | 187809-74-1 | |
| | 187809-75-2 | 189750-98-9 | 261703-74-6 | 261703-75-7 | 279246-65-0 | |
| | 323178-01-4 | 364634-79-7 | 364634-80-0 | 432004-53-0 | 432004-56-3 | |
| | 432004-59-6 | 478385-88-5 | 612543-59-6 | 612543-60-9 | 612543-61-0 | |
| | 612543-62-1 | 612543-63-2 | 612543-65-4 | 612543-66-5 | 612543-67-6 | |
| | 612543-68-7 | 612543-69-8 | 612543-72-3 | 612543-73-4 | 612543-74-5 | |
| | 612543-76-7 | | | | | |

RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(in nematic liquid crystal mixture suitable for ECB- or IPS-type liquid crystal displays)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

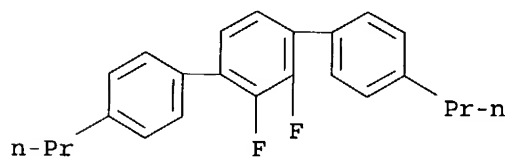
- (1) Chisso Corp; EP 0949232 A 1999 CAPLUS
- (2) Chisso Corp; EP 1081123 A 2001 CAPLUS
- (3) Chisso Corp; EP 1179522 A 2002 CAPLUS
- (4) Merck Patent Gmbh; WO 0246329 A 2002 CAPLUS
- (5) Merck Patent Gmbh; GB 2290787 A 1996 CAPLUS
- (6) Merck Patent Gmbh; WO 0179379 A 2001
- (7) Merck Patent Gmbh; DE 10107544 A 2001 CAPLUS
- (8) Merck Patent Gmbh; DE 10158081 A 2002 CAPLUS
- (9) Reiffenrath; US 6017469 A 2000 CAPLUS
- (10) Weber, G; US 5378395 A 1995

IT 121218-80-2 157248-25-4 612543-76-7

RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(in nematic liquid crystal mixture suitable for ECB- or IPS-type liquid crystal displays)

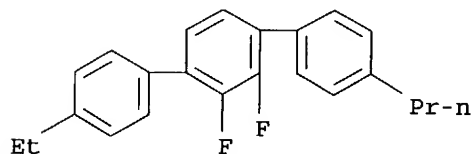
RN 121218-80-2 CAPLUS

CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipropyl- (9CI) (CA INDEX NAME)



RN 157248-25-4 CAPLUS

CN 1,1':4',1''-Terphenyl, 4-ethyl-2',3'-difluoro-4''-propyl- (9CI) (CA INDEX NAME)



RN 612543-76-7 CAPLUS

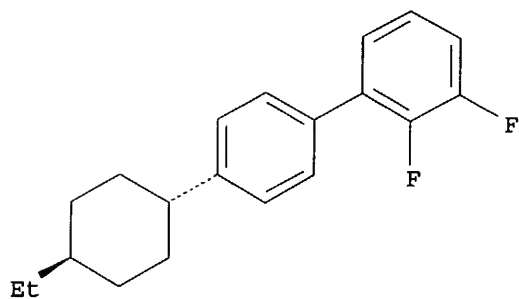
CN 1,1':4',1''-Terphenyl, 4-butyl-4''-ethyl-2',3'-difluoro-, mixt. with trans-2,3-difluoro-4''-(trans-4-propylcyclohexyl)-1,1'-biphenyl and 4''-(trans-4-ethylcyclohexyl)-2,3-difluoro-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 612543-75-6

CMF C20 H22 F2

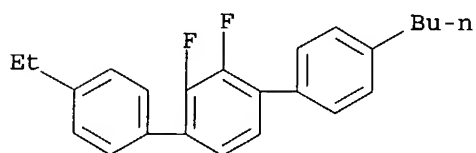
Relative stereochemistry.



CM 2

CRN 486406-09-1

CMF C24 H24 F2

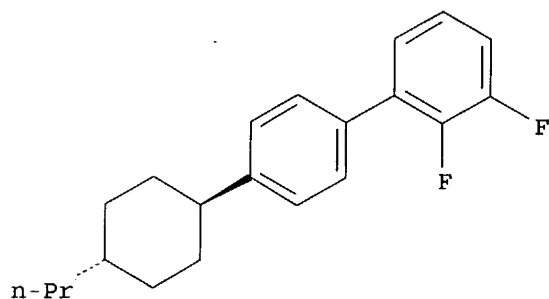


CM 3

CRN 162743-89-7

CMF C21 H24 F2

Relative stereochemistry.



L9 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN
 AN 2002:552225 CAPLUS
 DN 137:101517
 ED Entered STN: 25 Jul 2002
 TI Liquid crystal mixture with improved physical properties suitable for liquid crystal display
 IN Heckmeier, Michael; Schuler, Brigitte; Goetz, Achim; Poetsch, Eike; Binder, Werner
 PA Merck Patent G.m.b.H., Germany
 SO Ger. Offen., 28 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 IC ICM C09K019-20

T-0 FFM

ICS C09K019-42; G02F001-137; G09F009-35
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75

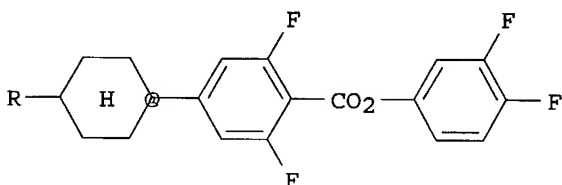
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|------------------|------|----------|------------------|----------|
| PI | DE 10152831 | A1 | 20020725 | DE 2001-10152831 | 20011025 |
| PRAI | DE 2000-10058471 | IA | 20001124 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|-------------|-------|-------------------------------------|
| DE 10152831 | ICM | C09K019-20 |
| | ICS | C09K019-42; G02F001-137; G09F009-35 |

OS MARPAT 137:101517
GI



AB The title liquid crystal mixture is based on a mixture of polar compds. with **pos. dielec.** anisotropy, wherein the liquid crystal mixture contains one or more compds. represented by formula I (R = C1-12-alkyl, alkoxy, alkenyl). The liquid crystal mixture also contains other specified compds. selected from compds. represented by 15 Markush structures.

ST nematic liq crystal mixt display

IT Liquid crystal displays

(liquid crystal mixture with improved phys. properties suitable for liquid crystal display)

IT Liquid crystals

(nematic; liquid crystal mixture with improved phys. properties suitable for liquid crystal display)

| | | | | | |
|----|-------------|-------------|-------------|-------------|-------------|
| IT | 61203-97-2 | 61203-98-3 | 66227-21-2 | 76802-59-0 | 76802-61-4 |
| | 81711-13-9 | 81936-32-5 | 84540-37-4 | 84816-56-8 | 85600-56-2 |
| | 86776-50-3 | 86776-51-4 | 86776-54-7 | 86786-89-2 | 87941-72-8 |
| | 96624-52-1 | 98321-58-5 | 102714-93-2 | 102714-95-4 | 106349-49-9 |
| | 121219-85-0 | 131819-23-3 | 132123-45-6 | 133914-50-8 | 133937-72-1 |
| | 135734-59-7 | 135734-60-0 | 137528-82-6 | 139215-80-8 | 139395-96-3 |
| | 145131-06-2 | 145305-20-0 | 145305-21-1 | 151359-00-1 | 151359-01-2 |
| | 154346-21-1 | 157248-25-4 | 173837-35-9 | 173837-36-0 | |
| | 174805-87-9 | 175859-25-3 | 181943-55-5 | 202116-87-8 | 279246-65-0 |
| | 432004-62-1 | 440666-87-5 | 440666-89-7 | 440666-91-1 | 440666-93-3 |
| | 440666-95-5 | 440666-97-7 | 440666-98-8 | | |

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(liquid crystal mixture with improved phys. properties suitable for liquid crystal display)

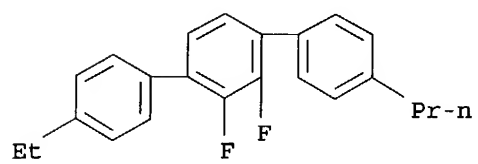
IT 157248-25-4

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(liquid crystal mixture with improved phys. properties suitable for liquid crystal display)

RN 157248-25-4 CAPLUS

CN 1,1':4',1''-Terphenyl, 4-ethyl-2',3'-difluoro-4''-propyl- (9CI) (CA INDEX NAME)



Tn F Fan

L1 STRUCTURE UPLOADED
L2 7 S L1
L3 119 S L1 FUL

FILE 'CAPLUS' ENTERED AT 14:36:05 ON 30 AUG 2004

L4 72 S L3
L5 1091 S POSITIVE DIELECTRIC
L6 0 S BIREFRIGEN?
L7 29087 S BIREFRING?
L8 1092 S POSITIVE DIELECTRIC?
L9 2 S L4 AND L8

=> s 14 and 17

L10 3 L4 AND L7

=> dis 1-3

L10 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:250678 CAPLUS
DN 140:294902
TI Liquid-crystalline medium having high **birefringence**
IN Manabe, Atsutaka; Bremer, Matthias; Kress, Elena
PA Merck Patent GmbH, Germany
SO U.S. Pat. Appl. Publ., 15 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

thi off

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|-------------------|------|----------|------------------|----------|
| PI | US 2004055529 | A1 | 20040325 | US 2003-658471 | 20030910 |
| | DE 10337016 | A1 | 20040325 | DE 2003-10337016 | 20030812 |
| PRAI | DE 2002-10242013 | A | 20020911 | | |
| OS | MARPAT 140:294902 | | | | |

L10 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:815300 CAPLUS
DN 139:314605
TI Liquid crystalline medium and electrooptical display containing it
IN Klasen-Memmer, Melanie; Bremer, Matthias; Rillich, Malgorzata
PA Merck Patent G.m.b.H., Germany
SO Eur. Pat. Appl., 66 pp.
CODEN: EPXXDW
DT Patent
LA German
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|---|------|----------|------------------|----------|
| PI | EP 1352943 | A1 | 20031015 | EP 2003-5738 | 20030314 |
| | R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK | | | | |
| | DE 10216197 | A1 | 20031030 | DE 2002-10216197 | 20020412 |
| | JP 2003327965 | A2 | 20031119 | JP 2003-108054 | 20030411 |
| | US 2003222245 | A1 | 20031204 | US 2003-412590 | 20030414 |
| PRAI | DE 2002-10216197 | A | 20020412 | | |
| OS | MARPAT 139:314605 | | | | |

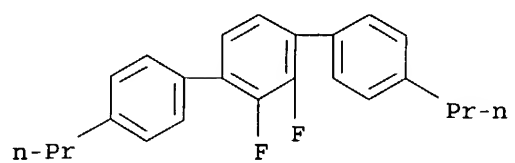
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:541185 CAPLUS
DN 113:141185
TI Polarized UV spectroscopy of conjugated liquid crystals
AU Wu, Shin Tson; Ramos, Elena; Finkenzeller, Ulrich

CS Hughes Res. Lab., Malibu, CA, 90265, USA
SO Journal of Applied Physics (1990), 68(1), 78-85
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English

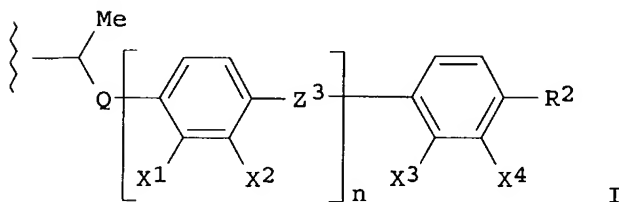
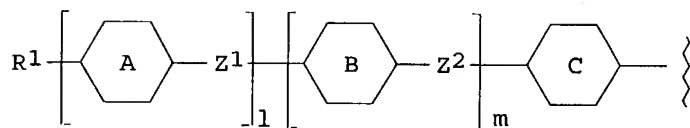
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L10 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1990:541185 CAPLUS
DN 113:141185
ED Entered STN: 13 Oct 1990
TI Polarized UV spectroscopy of conjugated liquid crystals
AU Wu, Shin Tson; Ramos, Elena; Finkenzeller, Ulrich
CS Hughes Res. Lab., Malibu, CA, 90265, USA
SO Journal of Applied Physics (1990), 68(1), 78-85
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
AB Polarized absorption spectra of 13 nematic liquid crystals (LCs) with various conjugations and structures were measured in the spectral range from 185 to 400 nm. These absorption bands represent all the $\pi \rightarrow \pi^*$ electronic transitions of these LCs. Resonance wavelength, absorption coefficient, and dichroic ratio of each band were characterized. The contribution of each band to LC **birefringence** is briefly discussed. Some structural effects on the LC absorption are illustrated. These absorption spectra will also serve as valuable data bases for further theor. calcns. on the band structure of LC mols.
ST nematic liq crystal polarized absorption spectrum; electronic transition nematic liq crystal **birefringence**
IT **Birefringence**
(of nematic liquid crystals, polarized UV spectroscopy in relation to)
IT Liquid crystals
(nematic, polarized absorption spectra of)
IT Ultraviolet and visible spectra
(polarized, of nematic liquid crystals)
IT Molecular structure-property relationship
(spectra, UV polarized, of nematic liquid crystals)
IT 40817-08-1 52364-71-3 54211-46-0, 5CT 56982-41-3, 5CDP 61204-01-1
92412-67-4 95480-29-8, PTP-502 **121218-80-2**, T-3FF3
121218-89-1, T-33FF 121477-67-6 123560-56-5, PTP-502FF 124251-30-5,
30CDP 129409-44-5, PTPT-35
RL: PRP (Properties)
(optical polarized absorption spectra of, in liquid crystal ZLI-2359 mixture)
IT 117631-11-5, ZLI-2359
RL: PRP (Properties)
(polarized absorption spectra of nematic liquid crystals dissolved in)
IT **121218-80-2**, T-3FF3
RL: PRP (Properties)
(optical polarized absorption spectra of, in liquid crystal ZLI-2359 mixture)
RN 121218-80-2 CAPLUS
CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipropyl- (9CI) (CA INDEX NAME)



=> dis 1-3 all hitstr

L12 ANSWER 1 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:289954 CAPLUS
DN 134:318781
ED Entered STN: 24 Apr 2001
TI Liquid crystal compound having branched methyl group, liquid crystal composition containing it, and display using it
IN Koizumi, Yasuyuki; Matsui, Shuichi; Takeuchi, Hiroyuki; Kubo, Yasuhiro; Nakagawa, Etsuo
PA Chisso Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C07C043-225
ICS C07D213-30; C07D237-08; C07D239-26; C07D309-04; C07D309-06; C07D319-06; C07D405-04; C07D407-04; C09K019-20; C09K019-28; C09K019-30; C09K019-34; C09K019-42; G02F001-13
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75
FAN.CNT 1
PATENT NO. KIND DATE APPLICATION NO. DATE
PI JP 2001114722 A2 20010424 JP 1999-290548 19991013
PRAI JP 1999-290548 19991013
CLASS
PATENT NO. CLASS PATENT FAMILY CLASSIFICATION CODES
JP 2001114722 ICM C07C043-225
ICS C07D213-30; C07D237-08; C07D239-26; C07D309-04; C07D309-06; C07D319-06; C07D405-04; C07D407-04; C09K019-20; C09K019-28; C09K019-30; C09K019-34; C09K019-42; G02F001-13
OS MARPAT 134:318781
GI



AB The liquid crystal compound comprises I [R1, R2 = C1-10 linear or branched (substituted) alkyl; A, B, C = trans-cyclohexane-1,4-diyl whose nonneighboring ring-forming methylene group may be replaced with O, 1,4-phenylene whose ring-forming CH group may be replaced with N; Q = O, S, (CH2)2O, O(CH2)2; Z1-Z3 = none, (substituted) C1-4 alkylene; l, m, n = 0, 1; l = m = n ≠ 1; X1-X4 = H, cyano, CF3, OCF3, F, Cl]. The liquid crystal composition contains I and the liquid crystal display uses the composition

The compound shows extremely large neg. dielec. anisotropic value ($\Delta\epsilon$) and small **optical anisotropic** value (Δn) and good compatibility to other liquid crystals to give display devices with low withstand voltage and small Δn value.

ST liq crystal branched methyl neg dielec anisotropy; display liq crystal branched methyl

IT Liquid crystal displays
Liquid crystals

(liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal composition and display)

IT 38289-27-9, trans-4-Propylcyclohexanecarboxylic acid

RL: RCT (Reactant); RACT (Reactant or reagent)

(Grignard reaction of; liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal composition and display)

IT 119488-52-7P

RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(hydrogenation of; liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal composition and display)

IT 335081-79-3P

RL: DEV (Device component use); PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal composition and display)

| | | | | | |
|----|-------------|-------------|-------------|-------------|-------------|
| IT | 22692-80-4 | 40817-08-1 | 51518-75-3 | 52709-83-8 | 57202-28-5 |
| | 57202-29-6 | 57202-30-9 | 58743-75-2 | 61203-99-4 | 64835-59-2 |
| | 67589-38-2 | 67589-39-3 | 67589-41-7 | 67589-47-3 | 67589-52-0 |
| | 75941-46-7 | 75941-48-9 | 75941-50-3 | 75941-51-4 | 75941-52-5 |
| | 79912-85-9 | 80944-44-1 | 81701-13-5 | 81936-32-5 | 82832-27-7 |
| | 82832-33-5 | 82832-34-6 | 82991-48-8 | 83242-83-5 | 84540-37-4 |
| | 84655-98-1 | 84656-75-7 | 84656-77-9 | 85312-59-0 | 86579-52-4 |
| | 86778-48-5 | 88416-69-7 | 88416-84-6 | 88416-89-1 | 88639-41-2 |
| | 88878-50-6 | 89129-90-8 | 92263-41-7 | 93743-04-5 | 95495-03-7 |
| | 95495-15-1 | 95495-17-3 | 95495-18-4 | 95906-34-6 | 96624-41-8 |
| | 96624-52-1 | 97398-80-6 | 98321-58-5 | 98495-10-4 | 98495-11-5 |
| | 100980-86-7 | 102714-92-1 | 102714-95-4 | 107215-73-6 | 107215-74-7 |
| | 107392-35-8 | 110881-30-6 | 114291-10-0 | 116090-24-5 | 116090-25-6 |
| | 116090-30-3 | 116090-32-5 | 116090-33-6 | 116090-34-7 | 116090-36-9 |
| | 116090-37-0 | 117923-23-6 | 117943-37-0 | 118164-51-5 | 120893-64-3 |
| | 121218-76-6 | 121218-79-9 | 121218-80-2 | | |
| | 122412-08-2 | 123560-48-5 | 123560-54-3 | 123787-68-8 | 124728-81-0 |
| | 124729-02-8 | 124770-58-7 | 124770-60-1 | 130746-66-6 | 130746-72-4 |
| | 131466-54-1 | 131819-23-3 | 131819-24-4 | 132123-39-8 | 132123-45-6 |
| | 132123-46-7 | 134412-17-2 | 134412-18-3 | 136922-42-4 | 137529-41-0 |
| | 139136-72-4 | 140212-75-5 | 140212-76-6 | 140212-77-7 | 145131-05-1 |
| | 146781-29-5 | 148150-89-4 | 148462-51-5 | 148462-52-6 | 157248-24-3 |
| | 157248-25-4 | 157248-27-6 | 157248-28-7 | 162744-15-2 | |
| | 173306-39-3 | 174350-05-1 | 174350-06-2 | 174350-07-3 | 174350-08-4 |
| | 175859-23-1 | 175859-24-2 | 175859-25-3 | 175859-28-6 | 176176-43-5 |
| | 178689-87-7 | 181369-18-6 | 181943-57-7 | 183145-19-9 | 184161-94-2 |
| | 196870-32-3 | 197012-69-4 | 208528-88-5 | 208664-36-2 | 223771-53-7 |
| | 335081-80-6 | 335081-81-7 | 335081-82-8 | 335081-83-9 | 335081-84-0 |
| | 335081-85-1 | 335081-86-2 | 335081-87-3 | | |

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

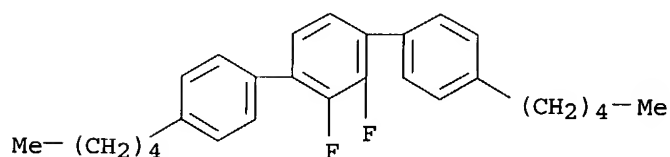
(liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal composition and display)

IT 186698-78-2P

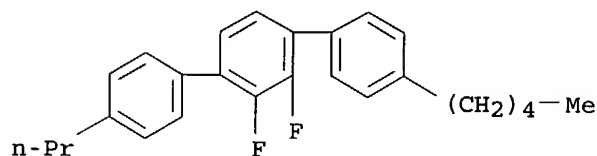
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(reaction with ethoxyfluorophenol; liquid crystal compound having branched Me group with large neg. dielec. anisotropic value for liquid crystal

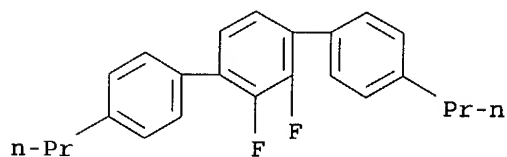
composition and display)
 IT 126163-56-2, 4-Ethoxy-2,3-difluorophenol
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reaction with propylcyclohexylethanol; liquid crystal compound having
 branched Me group with large neg. dielec. anisotropic value for liquid
 crystal composition and display)
 IT 121218-76-6 121218-79-9 121218-80-2
 157248-25-4
 RL: DEV (Device component use); TEM (Technical or engineered material
 use); USES (Uses)
 (liquid crystal compound having branched Me group with large neg. dielec.
 anisotropic value for liquid crystal composition and display)
 RN 121218-76-6 CAPLUS
 CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipentyl- (9CI) (CA INDEX
 NAME)



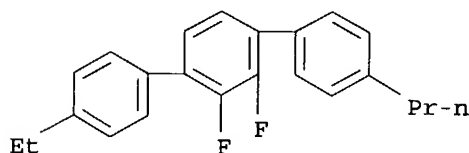
RN 121218-79-9 CAPLUS
 CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4-pentyl-4''-propyl- (9CI) (CA
 INDEX NAME)



RN 121218-80-2 CAPLUS
 CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipropyl- (9CI) (CA INDEX
 NAME)



RN 157248-25-4 CAPLUS
 CN 1,1':4',1''-Terphenyl, 4-ethyl-2',3'-difluoro-4''-propyl- (9CI) (CA INDEX
 NAME)



L12 ANSWER 2 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
 AN 1999:297389 CAPLUS
 DN 130:330631
 ED Entered STN: 14 May 1999
 TI Novel liquid-crystal compounds having large negative value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display device
 IN Miyazawa, Kazutoshi; Takeuchi, Hiroyuki; Kubo, Yasuhiro; Takeshita, Fusayuki; Nakagawa, Etsuo
 PA Chisso Corporation, Japan
 SO PCT Int. Appl., 76 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C07C043-225
 ICS C07C025-18; C07D319-06; C07D309-06; C09K019-30; C09K019-34; C09K019-42; G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

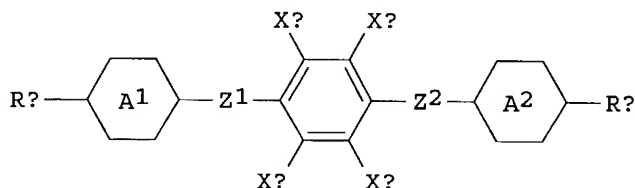
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--|------|----------|-----------------|----------|
| PI | WO 9921816 | A1 | 19990506 | WO 1998-JP4834 | 19981026 |
| | W: JP, US | | | | |
| | RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| | EP 1026143 | A1 | 20000809 | EP 1998-950385 | 19981026 |
| | EP 1026143 | B1 | 20040512 | | |
| | R: DE, FR, GB | | | | |
| | US 6348244 | B1 | 20020219 | US 2000-529989 | 20000424 |
| | US 2002030179 | A1 | 20020314 | | |
| PRAI | JP 1997-309918 | A | 19971024 | | |
| | WO 1998-JP4834 | W | 19981026 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|--|
| WO 9921816 | ICM | C07C043-225 |
| | ICS | C07C025-18; C07D319-06; C07D309-06; C09K019-30; C09K019-34; C09K019-42; G02F001-13 |

OS MARPAT 130:330631
 GI



I

AB Liquid-crystal compds. combining an extremely large neg. value of permittivity anisotropy with a small value of optical anisotropy; a liquid-crystal composition containing the same; and a liquid-crystal display element formed from the liquid-crystal composition The compds. are novel liquid-crystal compds. represented by general formula I having a 2,3-difluorophenyl moiety and the liquid-crystal composition contains any of the novel liquid-crystal compds., while the liquid-crystal display element is formed from this liquid-crystal composition; wherein Ra and Rb each represents linear or branched C1-20 alkyl in which any methylene group may have been replaced with -O-, -CH=CH-, or -C.tplbond.C-, provided that each -O- does not neighbor another -O-; ring A1 represents cyclohexane-1,4-diyl

in which any methylene group may have been replaced with -O-; ring A2 represents 2,3-difluoro-1,4-phenylene in which the hydrogen atoms at the 5- and 6-positions each may have been replaced with Me or a fluorine atom; Z1 and Z2 each represents a single bond or -CH2CH2-; and Xa, Xb, Xc, and Xd each represents a hydrogen, fluorine, or chlorine atom, provided that at least one of them is a fluorine or chlorine atom.

ST liq crystal display neg permittivity anisotropy

IT Liquid crystal displays

(liquid-crystal compds. having large neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display device)

IT 22692-80-4P 50649-59-7P 50649-60-0P 61203-99-4P 63221-88-5P
 63295-01-2P 67589-39-3P 67589-46-2P 67589-47-3P 67589-52-0P
 68400-50-0P 74305-48-9P 75941-46-7P 75941-90-1P 79709-84-5P
 80944-44-1P 81936-32-5P 82832-33-5P 82832-34-6P 82991-48-8P
 83242-83-5P 84540-37-4P 85312-59-0P 86377-38-0P 86579-52-4P
 86778-48-5P 88416-69-7P 88416-84-6P 88416-89-1P 92263-41-7P
 95906-34-6P 96624-41-8P 96624-52-1P 97398-80-6P 98321-58-5P
 100497-33-4P 102714-95-4P 107215-74-7P 110881-30-6P 116090-24-5P
 116090-25-6P 116090-30-3P 116090-36-9P 116090-37-0P 116903-46-9P
 116903-47-0P 117923-23-6P 121218-80-2P 121218-90-4P
 121218-98-2P 123560-56-5P 123787-68-8P 124728-81-0P 124729-02-8P
 124770-58-7P 124770-60-1P 124794-57-6P 130746-66-6P 130746-72-4P
 131466-54-1P 132123-39-8P 134412-17-2P 134412-18-3P 136922-42-4P
 137019-95-5P 140212-75-5P 140212-76-6P 140212-77-7P 145131-05-1P
 145918-41-8P 148150-89-4P 155905-85-4P 157248-24-3P 157248-27-6P
 157248-28-7P 162744-15-2P 174350-05-1P 174350-07-3P 181369-18-6P
 184161-94-2P 196870-32-3P 197012-69-4P 197012-83-2P 197012-85-4P
 197012-86-5P 208664-36-2P 223771-45-7P 223771-47-9P 223771-48-0P
 223771-49-1P 223771-50-4P 223771-51-5P 223771-52-6P 223771-53-7P
 223771-54-8P

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(liquid-crystal compds. having large neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display device)

IT 1073-06-9, 3-Fluorophenyl bromide 40649-36-3, 4-Propylcyclohexanone
 121219-07-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(liquid-crystal compds. having large neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display device)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Byron, D; Liq Cryst 1995, V19(1), P39 CAPLUS
- (2) Kanto Chemical Co, Inc; JP 06-228037 A 1994 CAPLUS
- (3) Matharu, A; Liq Cryst 1997, V23(4), P575 CAPLUS
- (4) Merck Patent GmbH; GB 2249309 A 1992 CAPLUS

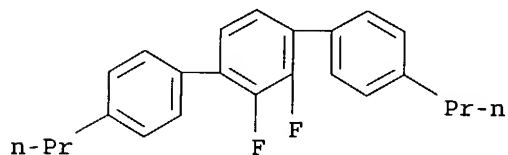
IT 121218-80-2P

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(liquid-crystal compds. having large neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display device)

RN 121218-80-2 CAPLUS

CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipropyl- (9CI) (CA INDEX NAME)



L12 ANSWER 3 OF 3 CAPLUS COPYRIGHT 2004 ACS on STN
 AN 1999:297388 CAPLUS
 DN 130:345123
 ED Entered STN: 14 May 1999
 TI 2,3-Difluorophenyl derivatives having negative value of permittivity
 anisotropy, liquid-crystal composition, and liquid-crystal display element
 IN Miyazawa, Kazutoshi; Takeuchi, Hiroyuki; Yagi, Hiroo; Takeshita, Fusayuki;
 Nakagawa, Etsuo
 PA Chisso Corporation, Japan
 SO PCT Int. Appl., 87 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C07C043-225
 ICS C07C025-18; C07C069-74; C07C069-76; C07D319-06; C07D309-06;
 C09K019-10; C09K019-20; C09K019-30; C09K019-34; C09K019-42;
 G02F001-13
 CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 Section cross-reference(s): 25

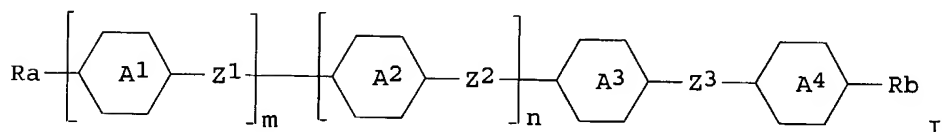
FAN.CNT 1

| | PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------|--|------|----------|-----------------|----------|
| PI | WO 9921815 | A1 | 19990506 | WO 1998-JP4833 | 19981026 |
| | W: JP, US | | | | |
| | RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| | EP 1026142 | A1 | 20000809 | EP 1998-950384 | 19981026 |
| | R: DE, FR, GB | | | | |
| PRAI | JP 1997-309919 | A | 19971024 | | |
| | WO 1998-JP4833 | W | 19981026 | | |

CLASS

| PATENT NO. | CLASS | PATENT FAMILY CLASSIFICATION CODES |
|------------|-------|--|
| WO 9921815 | ICM | C07C043-225 |
| | ICS | C07C025-18; C07C069-74; C07C069-76; C07D319-06; C07D309-06; C09K019-10; C09K019-20; C09K019-30; C09K019-34; C09K019-42; G02F001-13 |
| WO 9921815 | ECLA | C07C025/18; C07D241/12C; C07D319/06; C09K019/04; C09K019/30A2; C09K019/30A5; C09K019/30A5B; C09K001/30A1; C09K019/34A; C09K019/42; C09K019/44; C09K019/46 |
| EP 1026142 | ECLA | C07C025/18; C09K019/30A2; C09K019/30A1; C09K019/30A5; C09K019/30A5B; C09K019/34A; C09K019/42 |

OS MARPAT 130:345123
 GI



AB Liquid-crystalline compds. I having a large neg. value of permittivity
 anisotropy
 and a small value of **optical anisotropy**; a
 liquid-crystal composition containing the same; and a liquid-crystal display
 element
 formed from the liquid-crystal composition The compds. are novel

the 2,3-difluorophenyl derivs. represented by general formula (1) having a 2,3-difluorophenyl moiety and the liquid-crystal composition contains any of

compsds., while the liquid-crystal display element is formed from this liquid-crystal composition: wherein Ra and Rb each represents C1-10 alkyl or alkoxy, provided that in at least either, any at least one methylene group has been replaced with cyclopropane-1,2-diyl, -CF2-, or -CFH-; rings A1 to A4 each represents cyclohexane-1,4-diyl or 1,4-phenylene, provided that at least either of rings A3 and A4 is 2,3-difluoro-1,4-phenylene; Z1, Z2, and Z3 each represents a single bond, -(CH2)p-, -CO2-, -CF2O-, or -CH2O-; p is an integer of 2 to 4; and m and n each is 0 or 1.

ST difluoropheny permittivity anisotropy liq crystal compn display

IT Liquid crystal displays

(derivs. having neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display element)

IT 87625-09-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(2,3-difluorophenyl derivs. having neg. value of permittivity anisotropy)

IT 223908-60-9P

RL: PNU (Preparation, unclassified); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(2,3-difluorophenyl derivs. having neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display element)

IT 352-91-0, 3-Fluoropropyl bromide 134364-69-5, 2,3-Difluoroanisole

RL: RCT (Reactant); RACT (Reactant or reagent)

(2,3-difluorophenyl derivs. having neg. value of permittivity

anisotropy, liquid-crystal composition, and liquid-crystal display element)

| | | | | | |
|----|--------------|--------------|--------------|--------------|--------------|
| IT | 22692-80-4P | 40817-08-1P | 50649-60-0P | 51518-75-3P | 52709-83-8P |
| | 57202-28-5P | 57202-29-6P | 57202-30-9P | 58743-75-2P | 61203-99-4P |
| | 63221-88-5P | 63295-01-2P | 64835-59-2P | 67589-39-3P | 67589-41-7P |
| | 67589-47-3P | 67589-52-0P | 67589-53-1P | 68400-50-0P | 70567-18-9P |
| | 75941-50-3P | 75941-51-4P | 75941-53-6P | 76802-59-0P | 76802-61-4P |
| | 79709-84-5P | 79912-85-9P | 79945-42-9P | 80944-44-1P | 80955-71-1P |
| | 81701-13-5P | 81711-13-9P | 81936-32-5P | 82832-27-7P | 82991-48-8P |
| | 83242-83-5P | 84540-37-4P | 84655-98-1P | 84656-75-7P | 84656-77-9P |
| | 85312-59-0P | 86377-38-0P | 88416-69-7P | 88416-84-6P | 88639-41-2P |
| | 88878-50-6P | 89129-90-8P | 92263-41-7P | 93743-04-5P | 95495-04-8P |
| | 95495-15-1P | 95495-17-3P | 95495-18-4P | 95906-34-6P | 96624-41-8P |
| | 96624-52-1P | 97398-80-6P | 98321-58-5P | 98495-10-4P | 98495-11-5P |
| | 100497-33-4P | 100980-86-7P | 102714-92-1P | 102714-93-2P | 102714-95-4P |
| | 107215-66-7P | 107392-35-8P | 116090-24-5P | 116090-30-3P | 116090-32-5P |
| | 116090-33-6P | 116090-36-9P | 116090-37-0P | 116903-46-9P | 116903-47-0P |
| | 116903-48-1P | 116903-49-2P | 120893-64-3P | 121218-80-2P | |
| | 121218-90-4P | 121218-98-2P | 121219-85-0P | 122412-08-2P | 123560-47-4P |
| | 123560-54-3P | 123787-68-8P | 124728-81-0P | 124729-02-8P | 124770-58-7P |
| | 124770-60-1P | 124794-57-6P | 126334-45-0P | 130746-66-6P | 130746-72-4P |
| | 130746-81-5P | 133914-49-5P | 133937-72-1P | 135734-59-7P | 135734-60-0P |
| | 137784-79-3P | 140212-75-5P | 140212-76-6P | 145305-20-0P | 145918-41-8P |
| | 146781-29-5P | 157248-24-3P | 157248-27-6P | 157248-28-7P | 162744-15-2P |
| | 173306-39-3P | 174350-05-1P | 174350-06-2P | 174350-07-3P | 174350-08-4P |
| | 183145-19-9P | 184161-94-2P | 186320-72-9P | 196870-32-3P | 197012-69-4P |
| | 197012-85-4P | 202205-90-1P | 223771-50-4P | 223771-51-5P | 223771-52-6P |
| | 223908-40-5P | 223908-41-6P | 223908-42-7P | 223908-43-8P | 223908-44-9P |
| | 223908-45-0P | 223908-46-1P | 223908-47-2P | 223908-48-3P | 223908-49-4P |
| | 223908-51-8P | 223908-52-9P | 223908-53-0P | 223908-54-1P | 223908-55-2P |
| | 223908-56-3P | 223908-57-4P | | | |

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(derivs. having neg. value of permittivity anisotropy, liquid-crystal composition, and liquid-crystal display element)

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Anon; JP 07-133244 A CAPLUS

- (2) Anon; EP 332025 A1 CAPLUS
(3) Anon; DE 3807802 A CAPLUS
(4) Anon; DE 4027923 A CAPLUS
(5) Anon; EP 441940 A1 CAPLUS
(6) Anon; US 5232624 A CAPLUS
(7) Anon; US 5653913 A CAPLUS
(8) Anon; EP 640676 A1 CAPLUS
(9) Anon; EP 667384 A1 CAPLUS
(10) Anon; WO 89/8639 A1
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(12) Canon Inc; JP 02-115145 A 1990 CAPLUS
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(14) Merck Patent GmbH; JP 02-503435 A 1990
(15) Merck Patent GmbH; JP 04-501864 A 1992
(16) Sumitomo Chemical Co, Ltd; JP 07-267885 A 1995 CAPLUS
(17) Sumitomo Chemical Co, Ltd; JP 08-165258 A 1996 CAPLUS
(18) Sumitomo Chemical Co, Ltd; JP 08-81417 A 1996 CAPLUS
(19) Sumitomo Chemical Co, Ltd; JP 08-92137 A 1996 CAPLUS

IT 121218-80-2P

RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
(Preparation); USES (Uses)

(derivs. having neg. value of permittivity anisotropy, liquid-crystal
composition, and liquid-crystal display element)

RN 121218-80-2 CAPLUS

CN 1,1':4',1''-Terphenyl, 2',3'-difluoro-4,4''-dipropyl- (9CI) (CA INDEX
NAME)

